

CABLE OPERATORS

A CABLE MESSAGE IS REPRESENTED BY A WAVING LINE INSTEAD OF DOTS AND DASHES, AND THE OPERATOR MUST BE ABLE TO DISTINGUISH BETWEEN THIS AND LINES COMING FROM EARTH CURRENTS—EDISON, WHO IS ONE OF THE MOST EXPERT TELEGRAPHERS IN THE WORLD, ADMITS THAT HE IS UNABLE TO RECEIVE A CABLEGRAM.

Thomas A. Edison, who in his time has been one of the fastest telegraphers in the world, admits that he is totally unable to receive a cable message from across the Atlantic ocean. "While the ordinary Morse land dispatch is represented by makes and breaks of the current," he said recently, "the cable message is represented by a waving line. This line runs up and down irregularly. It is the length or value of the curves that enables the operator to detect the message. I have often watched the operators at work and I think it is wonderful that they are able to select the message at all. The line as it runs up and down is crossed and re-crossed by other lines coming from earth currents and the thousands and one sources from which stray current gets in. It is simply impossible for me to pick out the real message. Yet these fellows do it every time and with comparative ease."

IT DIFFERS FROM ORDINARY TELEGRAPHY.

Now, not only is this complimentary to the skill of the cable operators, but

the cable itself and of a certain eccentricity of the electric current when it is acting under long distances of water. Electricity invariably seeks to escape from its conductors to the earth. Mother earth will, in fact, absorb it and if given the chance. The cable is, therefore, insulated, but this desire to return to earth is stronger than the resisting power of the insulation; therefore, while the latter holds the current partially in, the gutta serena or other covering of cable is filled with innumerable stray lateral currents all seeking to escape to the surrounding water. With such a state of affairs it would be simply impossible to operate a succession of makes and breaks in the current; the residual currents would, in short, fill up the gaps. The difficulty is overcome by operating two keys on the siphon instead of one, as in ordinary telegraphy. One key is attached to the positive pole of the battery; the other key is attached to the negative pole. Thus by depressing either key an impulse is created in different directions over the line. As a short cut to brevity it may be said that the polarity of the current

comes unintelligible indeed. In such a case the operator is compelled to study the form of the line made by the earth current and then to note the difference between it and the true message. In short, he takes his search current line his zero mark and determines his message accordingly.

WHY IMPOSSIBLE TO TELEPHONE ACROSS THE ATLANTIC.

It is in this connection that we must look for the true reason why we are unable to telephone across the Atlantic. It is this electrification of the gutta serena that prevents it. There is no real insulating substance. Some substances insulate more than others but all are subject to electrification. When an electric impulse is sent across the ocean the whole of the cable, covering and all, must be electrified before the current flows through and operates the receiving device. It is what is known as the tail end of the charge that really carries the message. This interferes with the sound wave. In telegraphing there are only ten or twelve sound waves a second. In telephoning there are two or three thousand in the same time. It is obviously impossible to operate a telephone across the seas under existing circumstances.

A PHENOMENON OF CABLEING.

One of the peculiar phenomena of cableing is the ability of one operator to recognize a signal or rather the operator at the other end of the line, far away in England or France. It is a fact nevertheless that it is done and many strange friendships are formed between men who have never seen each other and who may never have been ten miles away from their respective homes thousands of miles apart. There is an old story of a man who refused to believe in a telegram sent to a friend because it "was not in his handwriting." This could not apply to cable operators. As soon as the siphon begins to make its waving lines on the tape, the operator, or rather the recorder of the same, knows who is at the other end of the wire. The "writing" of different operators is as recognizable at a distance of 3,000 miles as it would be if they were nearer at hand. The peculiarities of the man are detected on the tape, and without any attempt at slang a man is known by his curves. Some operators "write" in a plain hand and a message that is equivalent to what in ordinary life would be called very bad manuscript. If an operator gets into a rare and violently bumpy key, the fact is known to the men at the other end of the line, and he is promptly warned that, in another hemisphere. In the old days, long distance fights used often to occur, but talk on any private matters between operators is now strictly prohibited by the various cable companies.

HOW A BREAK IN THE CABLE IS LOCATED.

Sometimes a cable will break at the bottom of the sea, or some other place will prevent messages being sent through. Although the line extends through miles of drift and over leagues of ocean but the system has been reduced to such a point that the location of the fault is only a matter of a little calculation. It is generally located as follows: It is known that the resistance which the wire offers to the current averages a steady quantity to the mile. When a break or a fault occurs the resistance of the cable is measured in the cable station. This can be readily done because the circuit is generally completed by means of a magnet. When the resistance has been measured, it is easy to find out where the break is by dividing the whole amount by the average resistance per mile. It may thus be found that the break is two, three, four or five hundred miles off shore, as the case may happen to be. A cable-repairing steamer with a full corps of electricians on board immediately starts for the spot where the break is supposed to be. This is an easy matter, for when cables are laid the latitude and longitude of the cable laying ship is taken as each mile of the cable is paid out. If the break, as determined by the resistance, is say, 500 miles off shore, the captain of the repair boat directs his vessel to the particular junction of latitude and longitude which the cable was first laid. Having arrived at what he conceives to be the proper vicinity he steers his vessel into a course at right angles to the cable line. By the cable, he then throws an iron overboard and proceeds to grapple for the cable. He knows when he has caught the cable by the difference in the pull from the main cable. A cable line is struck. A rock when caught by the iron will finally let go with a jerk, but the cable when caught will exert a long, steady and obstinate pull as it is hauled to the surface. There is also a grapple on the cable which is used through the cable covering and electrically rings a bell. Having picked up the cable the chief electrician on board the boat cuts through the covering. It has not already been cut through by the grapple and attaching a transmitter to the core sends a signal through the cable. If he gets an answer from the other end of the line he knows, of course, that the break is beyond him or vice versa. If the answer comes from the European end,

ble companies to each other has always excused it.

CABLES OF THE WORLD.

No Atlantic cable runs directly to New York city at the present time. Most of the transatlantic lines land in the neighborhood of Nova Scotia or Newfoundland. The messages are re-transmitted by a coast line cable to the metropolis. The interval of time required in the re-transmission is not one second, for the operators read the messages letter by letter as they arrive at the New York city end of the cable. The new French cable to be laid next year will, however, have its terminus directly in New York city. It is expected that the competition thus engendered will enhance the general service. The coming congressional agitation over the installation of a Pacific cable will also revive interest in a scheme which must quicken the general process of civilization. The Japanese commercial awakening will certainly receive a further impetus when this cable is laid. The whole east, in fact, will be benefited and incidentally the United States will receive a distinct boom in the very direction where it needs it badly. There are already over 1,000 cables lying under the sea and the various water courses of the world. The cable gate over one and one-quarter millions of miles of cable line. A large fleet of steamers and an army of men are kept busy laying and repairing them. The cable industry is a large business in itself, even aside from the messages which are sent over the wires.

THEODORE WATERS.

A BULL FIGHT ON THE PLAINS.

The Description of a Lively Contest Between a Sturdy Old Buffalo and Two Daring Sioux.

BY CY WARMAN.

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"I was on the plains in the '60s," said the short man draining his glass of ordinary. He did not look over 30, but he must have been more than 40, for the tales he told carried so much of the color of the country that one found it difficult to disbelieve them. He was an ex-soldier, the Colorado legionnaire, and had come to Washington to work for the passage of a bill intended to relieve railway employees, and was now seated with a party of friends at one of the small tables in the Hotel Restaurant. Like many westerners his life had been varied and interesting. He had been a cowboy, an engineer, a railway postal clerk and politician. The Spanish gentleman had just finished an interesting account of a bull fight which had taken place at Barcelona in which, by some accident, the bull had the best of it.

"I was on the plains in the '60s," said the short man, laying his tools down, "right out in the open with nothing to hide behind, nowhere to stand but on, and nowhere to fall but off, as the deceased bard of St. Joe would say."

"It was while we were locating the line of the Union Pacific—simply driving across the country and making observations—a couple of Sioux fell in with our party and were riding along looking for a chance to steal something, when we came suddenly upon a small band of buffalo. The rear guard, a sturdy old bull, was feeding alone in a sort of brush between the hills and wind blowing from him to us, prevented him from scenting our party until the two Indians dashed by cutting him off from the main herd. Lowering his head the brute bounded away up the little hill, at the top of which the two Sioux sat waiting to receive him. Each of the Indians carried a rifle, but to our surprise they both fired at the same time. The bull made straight for one of the horses, but just as he seemed about to collide the broncho sprang to one side and an arrow from the Indian's bow was buried in the back of the bull. We expected the animal to bolt now, but he was enraged and scorned to escape. Turning he came straight for the other Sioux, only to pounce on the horse which he carried. The horse who carried his rider safely to the rear. The first Indian had by this time fixed another arrow, and when the charge was made, planted it deep behind the bull's right eye. The fight had by this time become so exciting that our driver, forgetting the danger, had driven up within a hundred yards of the scene of the battle. Carrying another arrow away with him, the infuriated animal caught sight of our wagon and drove straight for us. It was like standing on the track in front of a locomotive, and every man of us, realizing the great danger, was seized with a fear that almost froze our blood. The driver was so filled with terror that he was unable to attempt to avoid the collision, which from the moment the bull passed the Indian, seemed inevitable. On he came, snorting like a snow plow and looking as formidable, and not, as we had hoped, a mind enough to reach for a rifle. We were too badly scared to move, but not so with the Sioux. Seeing our danger the brave fellows turned their horses and came galloping just the bull, one on either side, and as they passed him each drove an arrow into the mad brute. These new wounds seemed only to increase his rage, and on he came, snorting and snorting, and before they reached our wagon the Indians whirled their horses and with arrows drawn stood between us and the approaching buffalo. The horses had barely time to turn before the bull was upon them. One of the bronchos sprang away, his rider emitting a wild yell as he sent another arrow into the bleeding buffalo. The other Indian was not so fortunate. His horse was caught in his side just behind the girth and plowed a great red furrow clean back to his flank. In the face of this great danger—the very door of death—the Indian stood to observe the actions of the wounded horse. For a moment he stood perfectly still, and then a shudder went over him, and with a cry that was half a moan he sank trembling to the earth.

The buffalo appeared to appreciate the advantage of his thrust and at once turned and charged the unhorsed Sioux. The Indian might have ended the fight by taking up his rifle, but he did not. Standing erect at the side of his dead horse he faced the rapidly advancing foe and sent an arrow deep under the shoulder blade. As the arrow struck the bull's side he reared up, his head cut through the covering, and beside the body of his horse and the buffalo passed over him without doing any damage. Now the mounted Sioux claimed the attention of the wounded bull, and the latter fairly bristled with arrows and resembled a huge porcupine. We could see that the animal was getting groggy, as they say of prize fighters, but he was determined never to leave him. With a roar that would send a chill down your spine, with blood spurting from his nostrils, he would drive like a hurricane at his tormentors, and with the exception of not attempting to avoid him by about the breadth of two hairs. When they had fought five minutes the earth for the space of fifty feet about resembled a plowed field. The horse and the bull were flecked with the froth of battle and like the buffalo showed unmistakable signs of exhaustion. As the action of the bull grew slower the horse's Sioux fought faster and faster. At times he would stand forth in the very face of the furious adversary and after discharging his arrow leap to one side, while the shaggy monster, as he was called, would dash at him.

"We were surprised at the beginning of the fight to see the Indians using their bows, allowing their rifles to remain in the saddle, but our surprise was still greater when the mounted Sioux turned his horse about and left the field, leaving his companion to fight it out single-handed. The bull

seemed to take new courage, finding but one of his assailants, and for a time fought desperately. Of a sudden he stopped, facing the Indian. With his front feet apart he appeared to rest, perhaps to collect his failing strength. He was an object now to excite one's pity, and although it may seem un-Christian, I almost wished he would win, for in those days there were nearly as many Indians as buffaloes, and they were infinitely more dangerous.

An arrow had destroyed one of the bull's eyes, blood was running from his mouth and nostrils and trickling from a score of wounds along his spine. His life blood was ebbing away, and now, as he made a last desperate effort to reach him. With a mighty roar the bleeding brute bounded forward and it seemed to us that he had regained all his lost strength for he went with the speed and force of an express train. The daring Sioux drew another arrow and let it drive into the buffalo, made a feint of dodging to the right, and then leaping far to the left, let another arrow as the baffled bull went by.

"The buffalo was by this time acquainted with the Sioux's tricks, and when he passed the Indian he whirled and came back at his adversary with renewed vigor. The Sioux, surprised perhaps by the suddenness of the charge, leaped back, stumbled and nearly fell backwards over the body of his dead horse. Before he could regain his feet the animal was upon him. It seemed that in another moment the Indian would be tossed high in the air, but the new lease of life the bull had was out and in that moment in which we had looked to see him triumph, the great brute stumbled and fell in a heap at the Sioux's feet."

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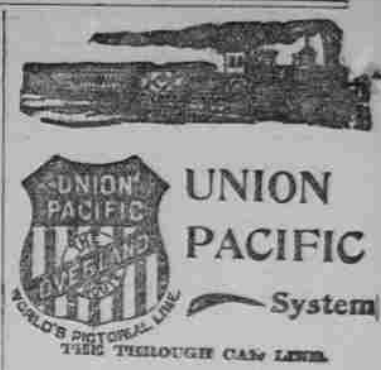
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